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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WILLS, MONIQUE M	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 04/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/845,178	LU ET AL.	
	Examiner	Art Unit	
	Wills M Monique	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed January 12, 2004. The rejections of the claims are as follows:

- Claims 1,2 & 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Nitta et al., U.S. Patent 5,393,622.
- Claims 1-7 & 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Yanai et al., U.S. Patent 6,368,749.
- Claims 1,2, 8-12 & 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Paulsen et al., U.S. Pub. 2003/0022063.
- Claims 1,2 & 13-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Sunagawa et al., U.S. Patent 6,333,128.
- Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Specification

The amendment filed February 3, 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: where all of the

nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air and all of the manganese has an oxidation state of +4 in air; and the stoichiometric value of x excluding x= 0.5, where $0 < x < 0.5$ and $0.5 < x < 1$.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the specification does not describe nickel having an oxidation state of +2 in air, cobalt having an oxidation state of +3 in air or manganese having an oxidation state of +4 in air. Further, there is nothing in the specification that supports excluding the stoichiometric value, x=0.5.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2 & 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Nitta et al. U.S. Patent 5,393,622.

Nitta teaches a non-aqueous lithium secondary battery comprising an anode, cathode and electrolyte (col. 1, lines 5-20). With respect to claims 1 & 19, the cathode composition has the formula $Li_yMi_{1-x}Mn_xO_2$ where $0 \leq x \leq 0.3$ and $1.0 \leq y \leq 1.3$ (col. 3, lines 50-55). With respect to claim 2, M^1 = Ni (col. 3, lines 50-55). The limitations are anticipated by the prior art set forth. The limitation in claim 1, with respect to the cathode composition being in the form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 fuel charge-discharge cycles at 30°c and a final capacity of 130 mAh/g using a discharge current of 30 mA/g, is considered to be an inherent property of the cathode material as set forth in the prior art, because Nitta employs the same cathodic material set forth by Applicant.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7 & 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Yanai et al. U.S. Patent 6,368,749.

Yanai teaches a non-aqueous lithium secondary battery comprising an anode, cathode and electrolyte (col. 3, lines 35-50). With respect to claims 1-3 & 19, the cathode composition has the formula $LiNi_aCo_bM_cO_2$ where $a+b+c=1$ and $0 \leq c \leq 0.5$ and M may be Mn as exemplified by Table 2 in cells: B3, B4, Y^2 and Y^4. See column 3, lines 50-55. With respect to claims 4 & 5, "y" is "a" which, according to the formula $a+b+c=1$ and $0 \leq c \leq 0.5$, "a" is less than 0.5. With respect to claims 6 & 7, $M^1 = LiNi_aCo_b$ and $M^2 = Ni_a$. The limitations are anticipated by the prior art set forth. The limitation in claim 1, with respect to the cathode composition being in the form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 fuel charge-discharge cycles at 30°c and a final capacity of 130

mAh/g using a discharge current of 30 mA/g, is considered to be an inherent property of the cathode material as set forth in the prior art, because Yanai employs the same cathodic material set forth by Applicant.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,2, 8-12 & 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Paulsen et al. U.S. Pub. 2003/0022063.

Paulsen teaches a non-aqueous lithium secondary battery comprising an anode, cathode and electrolyte (par. 41). With respect to claims 1,2,8 & 19, the cathode composition has the formula $Li[Li_xCo_yA_{1-x-y}]O_2$ where $A = [Mn_zNi_{1-z}]$ where $0.4 \leq z \leq 0.65$ and $0.1 \leq y \leq 0.3$ (par. 35). With respect to claims 9 & 10, "y" satisfies $0.1 \leq y \leq 0.3$. With respect to claims 11 & 12, $M^1 = Li[Li_xCo_yNi_{1-z}]$ and $M^3 = Co_y$. The limitations are anticipated by the prior art set forth. The limitation in claim 1, with respect to the cathode composition being in the form of a single phase having an O3

crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 fuel charge-discharge cycles at 30°c and a final capacity of 130 mAh/g using a discharge current of 30 mA/g, is considered to be an inherent property of the cathode material as set forth in the prior art, because Paulsen employs the same cathodic material set forth by Applicant.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,2 & 13-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Sunagawa et al. U.S. Patent 6,333,128.

Sunagawa teaches a non-aqueous lithium secondary battery comprising an anode, cathode and electrolyte (col. 5, lines 40-55). With respect to claims 1,2,13 & 19, the cathode composition has the formula $LiCo_bM_cNi_{1-b-c}O_2$ where $0 \leq a \leq 1.2$, $0.01 \leq b \leq 0.4$, $0.01 \leq c \leq 0.4$ and M is exemplified as manganese in Table 1. See Abstract.

With respect to claims 14-15, y= 1-b-c embracing $0.0983 < y < 0.5$ and $0.167 < y < 0.5$. With respect to claims 16-18, $M^4 = Ni_{1-b-c}$ and $M^5 = Co_b$. See Abstract. The limitations are anticipated by the prior art set forth. The limitation in claim 1, with respect to the cathode composition being in the form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 fuel charge-discharge cycles at 30°c and a final capacity of 130 mAh/g using a discharge current of 30 mA/g, is considered to be an inherent property of the cathode material as set forth in the prior art, because Sunagawa employs the same cathodic material set forth by Applicant.

Response to Arguments

Applicant contends that the 35 U.S.C. 102 rejections under Nitta '622, Yanai '749, Paulsen 2003/0022063 and Sunagawa '128 are moot because the references are silent to all of the Ni, Co, and Mn included in the compositions having oxidation states in air of +2, +3, and +4, respectively. Applicant asserts that the specification, at page 3, line 29 to page 4, line 2, requires the compounds to be charge neutral, yielding Ni, Co and Mn with oxidation states of +2, +3, and +4, respectively. The charges were calculated based on a generalized charge balance equation for each of the formulae, where the summation of charges must equal zero. Charge neutrality was obtained

only when Mn was in its +4 state (i.e., c = 4), Co was in its +3 state (i.e., b = 3), and Ni was in its +2 state. Although the calculations may be correct, the Examiner disagrees that the specification provides support therefor. The calculations were based on the premise that the compounds be charge neutral. Nowhere does the specification, implicitly or explicitly, require charge neutrality. The specification merely requires the elected metal to "exhibit appropriate oxidation states", which does not necessitate the compounds being charge neutral. An "appropriate oxidation state" may be satisfied by the elements having a plethora of various charges. Consequently, Ni, Co and Mn do not have to have respective oxidation states of +2, +3 and +4.

Claim 1 has been amended to define x as being (a) greater than 0 but less than 0.5 (i.e., $0 < x < 0.5$) or (b) greater than 0.5 but less than 1 (i.e., $0.5 < x < 1$). Applicant asserts that support for this amendment can be found, for example, in dependent claims 3 and 13. Claim 13 defines x as being equal to y, where $0 < y < 0.5$. Claim 13, therefore, provides support for a range of values for x having an upper limit of 0.5 (i.e., $0 < x < 0.5$). Claim 3 defines x as being equal to (2-y)/3,where $0 < y < 0.5$. According to this formula, when y is less than 0.5, x is necessarily greater than 0.5. Claim 3, therefore, provides support for a range of values for x having a lower limit of 0.5 (i.e., $0.5 < x < 1$). The Examiner disagrees. The instant claims nor the specification provide adequate support for the exclusion of $x=0.5$. With respect to claim 3, when $y=0.49$, $x=0.5$. Therefore, claim 3 does not require the exclusion of $x=0.5$ With respect to claim 13, does 0.49 and 0.51 materially alter the composition? Further,

claim 13 only provides support of x being less that 0.5 when x=y. This does not preclude x being equal to 0.5, nor x > y, when x does not equal y.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mw

03/26/04

Bruce Bell

BRUCE F. BELL
PRIMARY EXAMINER
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